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Increasing the accuracy of Arctic gravity field modeling using Cryosat-2 SAR altimetry

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The accuracy of the global marine gravity field is generally limited by the availability and accuracy of non-repeat altimeter data. Current models are based on the non-repeat data collected by the old Geosat (1.5year) and ERS-1 (0.9 year) geodetic mission based on the altimeter technology from the 70's and 80's, respectively. With the launch of Cryosat 2 years ago a new source of altimetric has become available. The Cryosat delay Doppler altimeter offers a factor of 20 improvements in along track resolution (important in the Arctic due to sea ice), an along-track footprint length that does not vary with wave height (sea state) and at least a factor of two in sea surface height precision.

Over the Arctic Ocean the Cryosat generally operates in SAR altimetry mode for cryospheric studies. We have tested the standard available L2 SAR altimetric data for the first 18 month along with retracked level-1 data using our own retrackers with respect to gravity field modeling in the Arctic Ocean.

Extensive testing and improvement of methods to handles the new class of data has been investigated and the first result from a new Arctic Ocean wide gravity field will be presented.